RISK BASED MAINTENANCE (RBM) FOR NATURAL GAS PIPELINE IN COMPANY X USING AHP-INDEX MODEL COMBINATION METHOD

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ABSTRACT

Pipeline has a very important role in the upstream oil and gas industry as a transfer media of natural gas production from the platform up to the customers. The failure of the pipeline operation will provide a great loss to company and customers.

Maintenance is an important activity to maintain the natural gas pipeline operations. Risk-Based Maintenance (RBM) is a maintenance method based on the risks that exists. The risk of failure of natural gas pipeline will be different from the initial installation as a result of the development pipeline environment and changes of flow characteristics of the substance.

This study begins by performing data collection, which consists of primary data and secondary data. Primary data obtained by conducting debriefing with an expert (expert judgment) through a questionnaire to determine the amount of the value of the index as a measure of the chances of risk. While the secondary data obtained from company data and used for assessment of pipeline and measure the impact of failure if it occurs. The data obtained will be processed to obtain the relative risk value using the combination method of Analytical Hierarchy Process (AHP) with the index model.

The results illustrate that the third party providing the highest risks in determining the level of risk from natural gas pipelines with a maximum weight of 0.434, followed by corrosion factor (0.195) and incorrect operation factor (0.195). For the sub-factor of a third party, the level of activity above the surface of the pipe is a dominant factor with the maximum weight value of 0.122 (28.2% of the sub factor in a third party). For the relative risk of each segment on company X, segment 3 (mainland) is a segment with the greatest potential risk.

Maintenance activities that should be done to reduce the level of risk are sub-bottom profile, free span checks and increasing frequency of patrols in those segments.

Key words: risk based maintenance (RBM), AHP, index models, pipeline maintenance strategy